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The botany of Slover mountain.

SAMUEL B. PARISH.

This is not a large mountain, rising hardly 500 feet above the mesas of the San Bernardino valley, in southern California, where it is situated. One can ride around it on level ground in a circuit of some two miles, for it is quite isolated from the neighboring range of hills. They are of the prevailing granitic formation of the region, while Slover is one of a very few protrusions of limestone, affording to the surrounding towns good lime and a fair quality of marble. To these economic advantages it doubtless owes the dignity of a name in a country where many more considerable elevations are left without one.

Everywhere it is very steep, and in places inaccessible. Its sides, for the most part, are of bare rock, and where there is soil it is thin and stony. It is without springs, so that the only moisture it obtains is from the scanty rain of the short winter.

One would expect the plants inhabiting such an arid rock to be few in number and of little interest. But in reality it possesses a vegetation of a very remarkable character. Not only is it well supplied with a considerable number of the commoner plants of the surrounding hills, but it also contains within its narrow limits a half-dozen species not found elsewhere for a distance of from 40 to over 100 miles. And it is noteworthy that several of these species, coming from several points of the compass, find here a common limit of their known ranges.

From the north there is *Cheilanthes Cooperæ* Eaton, elsewhere known at only three stations, the nearest at Santa Barbara. It is not abundant here, and grows mostly in deep fissures of the cliffs on the southwestern face, although a few plants may be found in other sheltered spots. Of this fern Slover is the southern limit. Several species come in from the deserts that lie to the east of the main range.

Notholæna cretacea Liebm., the N. candida of the Botany of California, is to be found in the seams of the rocks, exposed to the full blaze of the sun. Into such narrow cracks does it force its roots that actual quarrying is often necessary

to procure specimens. Like so many of the ferns of the southwest its fronds are curled up in summer in brittle knots that crumble at the touch, but expand and live again at the coming of the rainy season. In their exposed situation the Slover Notholænas lead an unusually intermittent life, unrolling their fronds at every shower and contracting them again with every dry wind from the north. The white-powdered form and the yellow-powdered are equally abundant, but the plants are smaller than those of the desert, where they often grow about the edges of boulders with their roots in the soil beneath. It is also found on the dry hills about San Diego, where several desert plants reach the sea. Our station is perhaps the westernmost one. It certainly is of *Erodium Texanum* Gray, whose eastern origin is indicated by its name, and which I have collected on the very summit. Elsewhere in this state it has been found springing up at a few places on the Mojave and the Colorado deserts.

Allium unifolium Kellogg, abundant on a stony northern slope, belongs to the west and north, in the coast range, and finds here its eastern limit. *Sisymbrium reflexum* Nutt., and *Amsinckia intermedia* F. & M., are to be noted as occurring here, quite away from their usual range. Both are not uncommon on the edge of the deserts, and the latter is also reported to grow near the coast.

Slover has also its own peculiar species, *Delphinium Parishii* Gray, which has as yet been discovered nowhere else. Its aspect suggests that it also may be an outlying member of the desert flora.

Why this insignificant hill should have so peculiar a flora is an interesting problem in geographical botany. That a particular species should be found only in a certain spot, or at least not in any similar one for many miles in any direction, is not uncommon in this region. It is true that this isolation in some cases may be only seeming, and due to a lack of thorough knowledge of the surrounding country, but it occurs too frequently in well explored ground not to be accepted as real. It is indeed one of the characteristics of our flora.

But here we have not one, as is usual, but seven isolated species gathered together in an area of a few acres. The geological formation of the mountain, so different from its neighbors, might appear to account for its peculiar vegetation. But in other places none of these species grow in calcareous soil, nor are they to be found on another outcrop-

ping of limestone a few miles away. Of the six species known to grow elsewhere, four belong to the deserts. But against the connection suggested by this fact is to be set the northern derivation of the two remaining species, so that no satisfactory solution presents itself.

NOTE. Since these notes were written Mr. T. S. Brandegee has published in the 25th volume (series II) of the Proceedings of the California Academy of Science, his valuable paper on the "Plants of Baja California." Mr. Brandegee finds *Delphinium Parishii* on the Californian peninsula from San Enrique northward. Slover mountain therefore becomes its northernmost habitat.

San Bernardino, Cal.

Notes on North American Willows. V.

M. S. BEBB.

1. SALIX HOOKERIANA, again. During the year 1835, Abraham Halsey, Esq., of Hartford, Connecticut, made a number of drawings for Dr. Barratt, designed to illustrate a work on North American Willows, which was never published. These drawings are now the property of Columbia College, and last summer Dr. Britton—thinking I might be interested—kindly sent them to me for inspection. They represent for the most part the species common about Dr. Barratt's home in Middletown, Conn., but among them I find one of S. Hookeriana, and under this, in Dr. Barratt's own handwriting, the following inscription: "*Salix Hookeriana* Barratt, n. sp. Herb. H. B. & T. no. 9. N. W. Coast from Mr. Scouler"! There is also a crude water-color (not done by Mr. Halsey) obviously worked-up from a tracing of herbarium specimens, and under this a repetition of the habitat and name of collector as given above. No botanist comparing the two sketches with the plate in the Flora Boreali Americana would fail to perceive that all three were drawn from specimens of a single gathering. Than this, nothing could be more satisfactory and conclusive. To Mr. Scouler belongs exclusively the credit of discovering this most remarkable willow, and the Saskatchewan habitat, which has all along held the first place in the books, and is the only one given by Andersson, is shown to have been a mistake from the beginning!

2. S. MYRTILLIFOLIA Anders. Sal. Bor.-Amer. 28. *S. Novæ-Angliæ* Anders. Monog. 160, and DC. Prod., 16. 2. 253, mainly. *S. myrsinites* Hook. Fl. Bor.-Amer. 2. 151, mainly. A pretty little willow found throughout the region of the Canadian lakes from north of Lake of the Woods (Dr. Bell) to Great Bear Lake (Richardson). "Common on the portage of the Grand Rapids of the Saskatchewan, near Lake Winnipeg" (Douglas), Athabasca Lake and river (Macoun), extending westward along streams and in low situations to the eastern foot-hills of the Rocky Mountains. After a careful examination of the collections of Richardson, Douglas and others, upon which Andersson founded his S. Novæ-Angliæ, I am satisfied that (with the exception of Drummond's Rocky Mt. specimens) all belong to one species, for which S myrtillifolia is the oldest (and best) name. It is useless and confusing to attempt to distinguish as varieties the different forms due to varying conditions of locality and exposure. Andersson himself, in the case of Richardson's collections, where aments and leaves of the same plant are under separate tickets, has referred the aments to one of his varieties and the leaves to another. The species is one of the plain from Lake Winnipeg north to the Arctic circle. Drummond's specimens, mentioned above, are more robust every way, with thick, white-woolly staminate aments, fertile immature, leaves wanting, and can not be safely determined, though most likely belonging to *S. monticola* Bebb.

3. S. ARBUSCULOIDES Anders. Monog. 147, fig. 81. *S. humillima* Anders. DC. Prod. 16. 2. 248. *S. acutifolia* Hook. Fl. Bor.-Amer. 2. 150. Arctic America (Mieschring and Dr. Raë). Mackenzies River (Dr. Richardson). Marshes near the Rocky Mountains (Drummond). The sessile capsule, very short bifid style, large emarginate gland and small serrulate leaves constitute a combination of characters so absolutely unique among American willows as to leave no doubt concerning the plant Andersson had in view, nor any as to its very close affinity with S. arbuscula. Prof. Macoun, who examined Andersson's types for me in the Kew herbarium, says that the specimens of Mieschring and Dr. Raë are all on one sheet with no means of telling to which, respectively, the labels belong; that they comprise apparently two or more species and are very imperfect, a few bearing very young catkins. It would appear probable from this that the entire leaf with stipules, figured by Andersson, belongs to some other plant than that from which was de-

rived the essential character of the species. Some of the distinctions noticed by Andersson disappear in Drummond's specimens: the aments are not conspicuously more loosely-flowered than in the European species, the capsules are not smaller and narrower (rather the reverse of this if there is any difference), but on the other hand the aments *are sessile or nearly so*, and the style, though distinct, *is very short*, and the habit is different. I should imagine that any European botanist familiar with the general aspect of S. arbuscula would—if he did not stop to examine closely—be likely to pass the American plant for a form of S. petiolaris, as Andersson himself passed the specimens of Richardson and Drummond in the Hookerian herbarium. In one of Drummond's specimens the leaves are clothed beneath with silky-white appressed hairs, the upper surface smooth and dark-green, making a pretty contrast; in another the leaves are much larger, 2 inches long by $\frac{1}{2}$ to $\frac{3}{4}$ inches wide and more coarsely crenate. While it is inexpedient to name varieties upon such scanty indications, there is sufficient evidence that the range of variation in the American plant is scarcely less pronounced than in the European S. arbuscula, and, furthermore, evidence which heightens the probability that as between two such variable species, inhabiting areas close to the homogeneous circumpolar flora, the one technical distinction between the two, drawn from the length of the style, may break down at any time. The author of S. arbusculoides can not go back and suppress his earlier name because incautiously compounded of Greek and Latin, and substitute for it (in DC. Prod.) S. humillima. The identification of Drummond's specimens clears up the obscurity which has hung over *S. acutifolia* Hook. (not Willd.), and will afford the basis for an improved characterization of the species. Strange to say, it is upon these old specimens we must still wholly rely. Although not indicated, by either Drummond or Richardson, as rare, the plant has entirely escaped the collectors of the present generation.

4. "S. SUBCORDATA" Anders. DC. Prod. 16. 2. 282. The specimens from which the description of this supposed new species was drawn are all attached to a single sheet in the Kew herbarium; they belong to three distinct and well known species; the name must therefore be dropped. As, one by one, the rarer and more obscure willows of the Canadian flora have been rediscovered by the botanists of the Canadian Natural History Survey—recent collections verifying and ex-

tending our knowledge of the types of the Flora Boreali-Americana—nothing approximating in character to *S. subcordata* And. has been found. Did Prof. Macoun and his associates, and myself as well, fail to appreciate the significance of the description, or was the plant indeed so very rare? In the midst of our bewilderment I asked Mr. Baker for any hint toward a solution of the difficulty which the type specimens might afford, receiving in response a drawing (elaborated from a tracing) of all the specimens on the sheet, all the labels copied and a few fragments, a capsule or two, to show minute characters. This led to the recognition of the corresponding numbers of the "Hooker, Barratt and Torrey" distribution in the Torrey herbarium, so that altogether it is possible to speak with assurance concerning the material which Andersson had before him. (1) Two large specimens of *S. arctica* Pall. (not R. Br.), almost certainly by some mistake ticketed as from the "Rocky Mtns. coll. Drummond," one specimen showing fertile aments past maturity. From these are derived the character of the aments, mainly, and the following: "Adult leaves orbicular-oval, 2′ long, nearly the same width, long-petioled, midrib and nerves acutely prominent, reticulate, margin entire, petioles yellow, buds large." (2) Two stunted specimens of S. adenophylla, leaves only, habitat not given. Here belong "leaves cordate, margin minutely glandular-denticulate, stipules acutely serrate, ornate." (3) Two specimens of *S. cordifolia* Hook., supposed to represent the early state of the preceding. In the Torrey herb. the S. arctica specimen is named "S. obovata var. glabra," the S. adenophylla specimen "S. cordifolia var. serrulata," so it appears Dr. Barratt regarded the two as distinct. How they came to be placed together on the Kew sheet is a mystery, and still more inexplicable is it how so critical a salicologist as Andersson should have been misled into combining the characters of the two in his "S. subcordata."

Rockford, Ill.

New mosses of North America. IV.

F. RENAULD AND J. CARDOT.

(WITH PLATES VIII AND IX.)

Bryum extenuatum.—In loose, yellowish tufts. Stems depressed, radiculose, branching below the perichætium by elongated innovations (15–30 mm. long), erect, slender, flexuous, generally attenuate and flagelliform. Stem-leaves distant, equal, erecto-patulous when moist, imbricate when dry, concave, from a long decurrent base ovate-lanceolate, shortly acuminate-cuspidate, entire or subsinuate toward the point, 1.50–2 mm. long, .50–.75 mm. broad; innovation-leaves much smaller and narrower; margins revolute from the base to above the middle; costa excurrent into a very short point, or vanishing just below the apex; cells of the areolation rhomboidal or hexagonal, 3–4 times longer than broad, rectangular at base, longer and narrower on the margins, but not forming a distinct border. Pedicel flexuous, 25–35 mm. long, reddish below, yellowish above. Capsule pendulous, narrowly cylindrical, constricted below the mouth when dry, and tapering to a long attenuate neck; lid convex, acutely apiculate. Teeth pale yellow; internal membrane very broad; segments split, cilia 2–3, long appendiculate. Annulus of 2–3 rows of cells. Dioicous. Male plant unknown.

Oregon: Portland, wet, sunny bluffs (*L. F. Henderson*).

This plant has the facies of some *Cladodium* (as *Bryum* (*Cladod.*) *purpurascens* R. Br), but the perfect structure of its peristome compels us to place it in the sect. *Eubryum*. By the form of the capsule it is related to B. capillare and other allied species, but is at first sight distinguished by its elongated, slender innovations, and its ovate-lanceolate and long decurrent leaves.

Bryum crassirameum. (*B. crassum* Ren. and Card. MSS., *non* H. et W.).—In robust, wide, compact, yellowish-green tufts. Stems robust, stout, branched, 3–5 cm. long. Leaves erect-patulous when moist, imbricate when dry, ovate-lanceolate, shortly acuminate, not decurrent, very entire or subsinuate at apex, 2–3 mm. long, 1–1.50 mm. broad; margins revolute from the base to near the apex; costa percurrent or vanishing just below the point; cells of the areolation rec-

tangular at base, hexagonal, 2–5 times longer than broad in the upper part, longer and narrower on the margins, but not forming a distinct border. Perichætial leaves more long acuminate. Pedicel reddish, flexuous, 3–5 cm. long. Capsule pendulous, badious or ferruginous, cylindrical, constricted below the mouth when dry, tapering to an attenuate neck; lid conic or subconvex, apiculate. Teeth yellow, densely trabeculate; segments split; cilia 2–3, appendiculate. Annulus of 3 rows of cells. Dioicous. Male plant growing with the female; flowers terminal, capituliform; antheridia large, with equal paraphyses.

Oregon: Oregon city, wet sunny bluffs (*L. F. Henderson*)

A fine species, allied to B. pseudotriquetrum, but quite distinct by the entire leaves, imbricate and not twisted when dry and without distinct border, the looser areolation and the narrower capsule.

Atrichum undulatum Beauv. var. **alteristatum.**—Lamellæ of the leaves much higher than in the typical form; capsule narrower and erect.

Kansas: Saline county (*Joseph Henry*). Pennsylvania: Reading (*Bischoff*). No. 314 of our set of *Musci Bor.-Amer. exsic.*, issued as *A. angustatum* BS., also belongs to this variety.

Closely resembling the *A. angustatum*, but distinct from it in the inflorescence and chiefly in the looser areolation of larger cells.

Fontinalis Kindbergii.—(Macoun, *Canadian Musci.*, no. 233).—Robust, a foot or more long, ferruginous, golden yellow and shining above. Stems naked below, subpinnate; branches plumose, subflexuous. Stem-leaves erect-patulous, concave, more or less distinctly carinate, ovate-lanceolate, acuminate, very entire, the upper large, 5–7 mm. long, 2.50–3 mm. broad, the lower much smaller and more shortly acuminate. Branch-leaves tristichous, divaricate, narrowly lanceolate, long acuminate, concave, inflexed on the margins, canaliculate above, rounded or subcarinate at back, 4–5 mm. long, 1–1.50 mm. broad. Cells of the areolation long linear, those of the angles enlarged, subquadrate, yellowish or ferruginous. Perichætial bracts convolute, suborbicular, entire at the truncate-rounded apex. Capsule immersed, oblong, 2 mm. long, .50–.75 mm. broad; lid conic. Teeth narrowly linear, slightly papillose, often connected in pairs at the

apex, with 25–35 lamellæ, not perforated on the dorsal line; lattice-cone of the inner peristome perfect, papillose, the transverse bars appendiculate. Dioicous. Male flowers numerous, sessile or pedunculate.

Vancouver Island, in ponds (*Macoun*). Oregon: High Cascade Mts., Lost Lake (*L. F. Henderson*).

This fine moss differs from the robust forms of F. antipyretica in its stem-leaves less distinctly carinate, longer acuminate, and its branch-leaves longer and narrower, divaricate. The peristome is the same as in F. antipyretica.

Antitrichia Californica Sulliv. var. **ambigua.**—Distinct from the type by the branches not julaceous, the leaves not so closely imbricate, generally subsecund and narrower, the cells longer and the pedicel often flexuous. It resembles in habit A. curtipendula, but differs from it in the cylindrical, narrow capsule, the perichætial leaves longer acuminate and the shorter cells.

Oregon: Portland (*L. F. Henderson*).

Climacium dendroides W. M. var. **Oreganense.**—Differs from the type in the leaves narrower at base, less serrate at apex, sometimes subentire.

Oregon: Willamette River, on ground and old logs (*L. F. Henderson*).

Climacium Americanum Brid. var. **Kindbergii.**—A remarkable form, distinct from the type by the leaves shorter, more distant, loosely imbricate, and the cells of the areolation nearly equal, short, ovate, scarcely 1–2 times longer than broad.

Louisiana: Lafayette's woods (*A. B. Langlois*). Massachusetts: Wellesley, with transitions to the type (*Miss Clara E. Cummings*).

Heterocladium aberrans. (*Microthamnium aberrans* Ren. and Card. MSS.).—Intricate-cespitose, pale or yellowish green. Stems flexuous, creeping, radiculose, more or less regularly pinnate; branchlets ascending, flexuous. Stem-leaves squarrose, auriculate, from a cordate-ovate base long acuminate, generally subulate, 1.25–1.50 mm. long, .50–.75 mm. broad; borders plane, sinuate-crenulate all around, costa forked, with one of the divisions longer and vanishing about the middle; areolation loose, pellucid, of soft thick-

walled cells, elongated, linear, truncate or obtuse, 4–10 times longer than broad toward the costa, the others irregular, ovate, roundish or subhexagonal, sometimes slightly papillose. Branch-leaves shorter, acute or obtuse. Perichætial leaves acuminate to a reflexed denticulate point, thin-nerved; paraphyses numerous, long. Pedicel purple, smooth, 15–17 mm. long. Capsule horizontal, ovate, curved, 1.50 mm. long, .50–.75 mm. broad; lid unknown. Teeth yellow, acuminate, densely trabeculate; segments narrowly split; cilia shorter, nodulose. Male flowers unknown.

Idaho: Kootenai county, on logs (*J. B. Leiberg;* kindly communicated by Mr. Ch. R. Barnes).

This moss, with the aspect of some tropical Microthamnium, is closely allied to *Pterogonium (Heterocladium) procurrens* Mitt., but according to the description and figures given by Mr. Mitten in Journ. Linn. Soc. viii, 37 and pl. 7, this last species is a more robust plant, with inequilateral branch-leaves, the perichætial leaves only patent and not reflexed at their point, the pedicel longer and the capsule not curved. These two species constitute in the genus Heterocladium a section which we name Eurybrochis, characterized by the loose, pellucid, smooth or scarcely papillose areolation.

Brachythecium acuminatum (Beauv.) var. **subalbicans.**—Facies of the *B. albicans* (Neck.). More robust than the type, pale yellow; branches silky, julaceous; areolation denser, cells narrower.

Louisiana: Bayou des Cannes, foot of trees (*A. B. Langlois*). Florida: Enterprise (*Fitzgerald*).

Brachythecium Idahense.—Intricate-cespitose, bright green. Stems depressed, creeping, irregularly pinnate; branches ascending, subincurved. Leaves crowded, subsecund, from an ovate base lanceolate, long acuminate, plicate, costate to above the middle, 1 mm. long, .35–.50 mm. broad; borders denticulate all around or subentire, plane or more or less revolute; cells linear, attenuated, those of the angles subquadrate, numerous. Perichætial leaves rather suddenly acuminate, obsoletely costate or subecostate. Pedicel purple, smooth, 10–17 mm. long. Capsule horizontal, ovate, gibbous, curved, 1.50–2 mm. long, 1 mm. broad, lid obtusely conic. Teeth lanceolate-acuminate, densely trabeculate; segments broadly split; cilia long, nodulose. Monoicous.

Idaho: Lake Pend d'Oreille, on logs (*Leiberg;* kindly communicated by Mr. Ch. R. Barnes).

This species rather resembles *B. Bolanderi* Lesq., but it is distinct by the smooth pedicel, the monoicous inflorescence, the thicker capsule, the larger size and the bright green tint of the tufts. It is more closely allied to the European *B. olympicum* Jur. (*B. venustum* De Not.), from which it differs in the larger size, the larger, broader, plicate leaves, the basal areolation looser, with angular cells more numerous, quadrate, thin-walled, the costa narrower and shorter, and the lid obtuse, not apiculate.

Scleropodium caespitosum (Wils.) var. **sublæve.**—Pedicel nearly smooth, slightly rough only below the capsule.

Oregon: Sauvie's Island (*Th. Howell*).

Raphidostegium Regelianum (C. Müll.) var. **Floridanum.**—Scarcely distinct from the South American type by the shorter and broader capsule, rounded or less attenuate below.

Florida: Enterprise, trunks of palms (*Fitzgerald*).

Hylocomium triquetrum (L.) var. **Californicum.**—Very robust; leaves strongly rugose-undulate, strongly papillose above; capsule short.

California (*Mrs. Mary E. Pulsifer Ames*).

Remark on *Rhacomitrium Oreganum* Ren. and Card., Bot. Gazette, 1888, 98.—From the examination of an authentic specimen of *R. varium* Mitt., we recognize that our *R. Oreganum* must be identified with this species, but the description given in the *Manual*, 150, is not quite exact, the hair-point of the leaves being denticulate, not entire, and the upper cells elongated, not round-quadrate.

Monaco and Stenay, France.

Explanation of Plates viii and ix.—Nearly all the figures are drawn by means of Nachet's camera lucida:

Plate viii.—A. *Bryum extenuatum* *a*, entire plant; *b*, *b*, stem-leaves; *c*, areolation in the middle; *d*, areolation of the apex; *e*, innovation-leaves; *f*, capsule; *g*, portion of the peristome.—B. *Bryum crassirameum.* *a*, entire female plant; *b*, male plant; *c*, *c*, leaves; *d*, basal areolation; *e*, areolation in the middle; *f*, areolation of the apex; *g*, capsule; *h*, portion of the peristome.

Plate ix.—A. *Fontinalis Kindbergii.* *a*, part of stem; *b*, stem-leaf; *c*, branch leaf; *d*, perichætium and capsule; *e*, capsule.—B. *Heterocladium aberrans.* *a*, entire plant; *b*, *b*, stem-leaves; *c*, basal areolation toward the

costa; *d*, areolation in the middle, on the margin; *e*, areolation of an auricle; *f*, areolation of the point; *g*, *g*, branch-leaves; *h*, perichætial leaf; *i*, capsule; *j*, portion of the peristome.—C. *Brachythecium Idahense*. *a*, entire plant; *b*, *b*, leaves; *c*, basal areolation; *d*, areolation of the upper part; *e*, perichætial leaf; *f*, capsule.

An undescribed Heuchera from Montana.

DANIEL C. EATON.

Heuchera (§ Holochloa) Williamsii. Sesquipedalis ad bipedalis; foliis omnibus radicalibus orbiculari-reniformibus leviter crenatis ciliolatis ceterum fere lævibus (unciam ad sesquiunciam latis); scapis elatis gracilibus nudis puberulis; racemo gracili spiciformi 10–12-floro; floribus remotis subsessilibus, bracteis minutis squamiformibus; calycis tubo primum obconico serius subcylindraceo, lobis brevibus albidis; petalis (3 lineas longis) albidis erectis spathulatis integris unguiculatis; stylibus staminibusque brevibus omnino inclusis.

Montana, collected by Mr. Robert S. Williams in the Belt Mts., in July, 1882, in the Highwood Mts. in 1888, and in Lower Belt Park in 1889.

This is a slenderer plant than H. cylindrica, and has more entire leaves and more distant flowers than either that species or H. bracteata or H. Hallii. It has somewhat the look of a Tellima, to which genus I at first referred it, but as the petals are entire and the stamens uniformly five, it comes fairly within the definition of Heuchera, even though the ripened capsule protrudes a little beyond the lobes of the calyx. Mr. Canby informs me that he has specimens collected by himself at Nevada creek in 1883, and others from Boseman collected by Prof. Scribner, and others again from Jefferson City, Yellowstone Park and Beaver Head Co. collected by Mr. Tweedy. Mr. Canby had sent specimens to the Gray Herbarium, with the MSS. name of Tellima pentandra; but as the whole genus Heuchera is normally pentandrous, and as Mr. Williams appears to have been the earliest collector of the plant, he kindly writes that he can see no possible objection to the name here proposed. Mr. Williams resides at Great Falls, Montana, and has devoted much time to the study of the flora of the neighboring region; and it is with great pleasure that I find an opportunity of naming a Montana plant in his honor.

New Haven, Conn.

Notes on some western plants.

J. N. ROSE.

(WITH PLATE X.)

Aquilegia Jonesii Parry.—This beautiful little Columbine was first collected by Capt. W. A. Jones on Phlox Mt., Wy., in 1873, and Dr. Parry tells me but a single flower was obtained. Mr. Canby collected it at the Upper Marias Pass, Rocky Mts., Montana, 1883; also in fruit at an altitude of 8,000 feet. Mr. Tweedy now gets it in great abundance in flower and fruit from mountains on East Bowlder River, subalpine limestone slides (June, 1889), Park county, Montana.

Elatine Californica Gray.—The only published station of this species is Webber's Spring, in the Sierra valley, N. Cal. (J. G. Lemmon); also collected in Spokane county, Washington, in borders of ponds by Suksdorf (1884). Dr. H. E. Hasse has sent me specimens collected this season (1889) from a small pond near Los Angeles, and far away from the only two known stations. Dr. Hasse writes: It would be of interest to be able to account for the sudden appearance here of some of the plants sent you. In the past spring, at the grounds of the Soldiers' Home, an artificial pond was made, where no running or standing water had been, and on the margin of this pond this species with other rare ones were collected. Now, once, or several times during spring and autumn at the equinox, heavy winds, lasting a couple of days, set in, called sand-storms. These are quite severe, obscuring the air with clouds of dust and sand, and which may account for the distribution of these seeds.

Hymenatherum pentachætum DC.—At San Diego, Texas, collected by G. C. Nealley (1889). There are no specimens of this in the National Herbarium by recent collectors, but most of the older collectors got it in abundance. J. G. Lemmon's specimens, collected August, 1884, at Laguna, N. Mex., prove to be the very rare species H. Thurberi, only found by Wright and Thurber.

Nama stenocarpa Gray.—This species has its stamens bearing small appendages at the base. Two other species, P. Schaffneri and P. stenophyllum, are also described with appendages. Dr. Hasse sends this plant from Los Angeles county, Cal. It has only been found before in the southeastern part of the state.

Monardella macrantha Gray.—C. R. Orcutt sent two specimens from Cuyamaca Mts., Cal. (1889), with smaller heads than the type (5 to 8-flowered). Palmer collected the species in the same mountains in 1875 (294), and G. R. Vasey in the St. Lucian Mts. (487), 1880, and the var. nana at Julian, Cal.

Chorizanthe Vaseyi Parry & Rose n. sp. Decumbent, branching from the base, 3–6 inches broad, more or less strigose or lanate pubescent throughout: leaves all radical, spatulate tapering below to a winged petiole, lanosely pubescent beneath: involucre with narrow triangular tube slightly swollen at base, divisions 3, divergent, as long as the tube or somewhat longer, channeled and somewhat corrugated above, terminating in straight cusps, the membranous intervals with a distinct ciliate tuft: perianth partly exsert, yellow, short pedicellate with long narrow tube, segments nearly equal one-third the length of the tube, ovate acuminate: stamens as long as the perianth, anthers oblong, filaments inserted at the base: ovary smooth, broadly triangular, with long curved styles: embryo not seen.

Habitat: Lagoon Head, Lower California, no. 275, Dr. E. Palmer, March, 1889. An interesting addition to the Euchorizanthe section, combining some of the characteristics of C. brevicornu and the South American C. commisuralis. The specific name very properly commemorates the services of Dr. George Vasey, Botanist to the U. S. Agricultural Department, under whose auspices the recent valuable collections of Dr. Palmer have been made known to the botanical world.

EXPLANATION OF PLATE X.—*a*, the involucre; *b*, division of involucre with "ciliate tuft;" *c*, flower.

The following additional notes upon a few of the species collected by Mr. Frank Tweedy in 1888–1889 are appended. The author is grateful to W. M. Canby for assistance in the determination of species.

Astragalus platytropis Gray.—This very rare species was collected by Mr. Tweedy in Beaver Head county, Montana, July, 1888. It has not before been found in this region and is new to Coulter's Rocky Mountain Manual. It was first collected in the Sierra Nevada Mountains above Sonora Pass at 10,000 ft. (*Brewer*, 1860–1862), the only other collection being that of Sereno Watson on East Humboldt Mountains, Nevada, 6,000 ft., July, 1868. Leaflets six lines long, lanceolate and acute; pods a little over an inch long.

Astragalus reventus Gray.—Another species new to Montana and only known from Oregon and Washington. Collected by Mr. Tweedy, June, 1888, Beaver Head county, Montana.

Erigeron Tweedyana Canby & Rose, n. sp.—Perennial, from a multicipital caudex 4 to 8 inches high, simple or somewhat branched, soft pubescent below, becoming lanate above (apparently densely white lanate when young): leaves narrowly linear, 2 to 2½ inches long, crowded at base, reduced and scattered above, somewhat pubescent: heads 3 to 5 lines high, a little broader, terminating simple stems on the branches; the peduncles long and naked or with few bract-like leaves: involucre of numerous narrow acuminate bracts, in a single rather crowded series, with tips a little spreading, densely lanate: rays numerous, conspicuous, white: pappus double, the outer multisquamellate: akenes pubescent.

Collected by Mr. Frank Tweedy, June, 1888, in Park county, Montana.

Here probably should be referred F. L. Scribner's no. 77, in part, from the Little Belt Mountains, Montana, Aug. 12, 1883, altitude 7,500 feet. The lanate pubesence of the involucre and double pappus seems to ally this species with E. Muirii of the far north. It is closely related to E. pumilus, but with larger heads, softer pubescence, etc. Its closest alliance, however, is probably with E. Brandegei of Colorado, but a careful comparison with specimens in the Gray Herbarium, and a good specimen communicated by Mr. Brandegee, show that the two are distinct. E. Brandegei has smaller almost globular heads, very short almost naked bracts (even in flowers), etc. *E. Tweedyi* Canby is evidently only a large form of *E. tener* Gray.

Erigeron Parryi Canby & Rose, n. sp. A somewhat similar species but depressed, one to two inches high, pubescence villous, spreading: heads solitary on the stems (in one case two heads), 3 lines high: rays 40 to 50, white, short and rather broad, 3-dentate at tip: involucral scales tapering to a sharp point, purplish at tip: pappus double, the outer short, the bristles as thick as those of the inner.

Dry hills, 7,000 feet altitude, on Grasshopper Creek, Beaver Head county, Montana, July, 1888 (*Frank Tweedy* 15).

Near E. pumilus and also near E. radicatus, differing

from the latter in the narrow and very hirsute leaves, in the double pappus and dentate tipped rays.

Tanacetum capitatum Torr. & Gray.—This little plant, only known from the Rocky Mountains of North Wyoming and collected by Nuttall & Parry, was collected by Mr. Tweedy in June, 1888, in Beaver Head county, Montana. It grows on dry hills, 5,300 to 7,000 feet altitude. We are indebted to Mr. Canby for the determination of this rare species.

Penstemon Tweedyi Canby & Rose, n. sp. Three to six inches high, of a purplish hue, from a woody caudex, glabrous except the inflorescence, which is glandular puberulent: leaves mostly radical, 10 to 15 lines long, lanceolate, spatulate or narrower; stem leaves bract-like, one or two pairs below the flowers: flowers 3 to 8, mostly unilateral: calyx with somewhat unequal acute lobes: corolla bilabiate, purplish, 3 to 4 lines long: anthers dehiscent from base to apex through the junction of the two cells, glabrous; sterile filament glabrous.

Sub-alpine bogs, 9,500 feet altitude, Beaver Head county, Montana, June, 1888. Collected by Mr. Frank Tweedy (no. 35), a zealous collector in this region for the past eight years, and author of "Catalogue of the Plants of Yellowstone Park."

Our plant seems clearly to belong to Gray's sixth subsection of Eupentstemon. It resembles some simple entire forms of P. humilis, but differs in its glabrous sterile stamen, almost naked stem, etc.

Washington, D. C.

Dr. Charles C. Parry.

Our western flora can hardly be touched at any point without encountering the name of Parry, our oldest and most distinguished botanical explorer. Hundreds of new plants were brought to light by him, and although he has written very little his name must always be a prominent one in American botany.

He was born at Admington, Worcestershire, England, August 28, 1823, and died at Davenport, Iowa, February 20, 1890. In 1832 his family came to America and settled on a farm in Washington county, New York. He graduated at

Union College, Schenectady, and then studied medicine. It was the attractive flora of northeastern New York that first awoke his interest, and through his acquaintanceship with Drs. Torrey and Gray this interest became a life-long passion.

At the age of twenty-three he removed to Iowa, settling at Davenport, which always remained his home, so far as he had any abiding place.

It was in 1848 that his real work as an explorer began, in connection with David Dale Owen's geological survey of the Northwest, his collections being made along the St. Peter River and up the St. Croix as far as Lake Superior. In 1849 he was appointed botanist to the Mexican Boundary Survey, going by way of the Isthmus of Panama to San Diego. In 1850 the trip was repeated, owing to the loss of the collection in a storm. In 1851 he was ordered to El Paso, on the Rio Grande, exploring regions never before and but seldom since visited by botanists. The rich collections of these two years are found described in the well-known report of the Mexican Boundary Survey.

In 1861 he began his series of explorations in the Colorado Rocky Mountains, the work being undertaken at his own expense. One who has seen the charming flora of the Colorado peaks can well understand the enthusiasm of Parry as he fairly reveled in this untrodden ground and brought to light its beautiful alpine plants. It was an experience which has fallen to the lot of very few botanists, and it is little wonder that exploration became his passion. But in all his subsequent varied experiences as a collector, it is said that he always remembered his alpine plants of the Colorado mountains with the warmest affection.

In 1867 he became botanist of the Pacific railroad survey that crossed the continent on the parallel of 35°.

In 1869 Dr. Parry was appointed botanist of the Department of Agriculture, a position which he held for nearly three years.

The remaining twenty years of his life were entirely devoted to exploration, much material being collected by him in Utah, Nevada, California and Mexico. His last years were devoted more to the study of certain groups than in making general collections, and his work on Ceanothus and Chorizanthe is unusually well fortified by a wealth of acute field observations. His last new species of Chorizanthe is published in this number of the BOTANICAL GAZETTE.

His herbarium must be remarkably rich in western plants, and is deposited, as we understand, among the collections of the Davenport Academy of Sciences.

In Dr. Parry's death we lose another of our veteran botanists, and the day seems not far distant when an entirely new generation will stand for American botany.

BRIEFER ARTICLES.

The system of arrangement of genera in the National Herbarium.— In order to facilitate the work of reference to the specimens in the National Hebarium, the following system of arranging and labeling the orders and genera has been adopted by Dr. Vasey:

Durand's Index[1] has been taken as the basis for nomenclature and arrangement. This book forms a compact index of the genera and orders of Phanerogams, based upon the Genera Plantarum of Bentham and Hooker, and published with Hooker's approval. The Genera Plantarum was published in parts, covering a period of twenty-one years, ending in 1883. The changes in nomenclature during this period, notably those brought out in DeCandolle's Monographs, have been incorporated in the work. It will be, for many years to come, the standard index to the genera of Phanerogams, and the general use of its numbers by botanists will greatly aid reference to and between large herbaria. Our standard check-lists, too, should use the same numbers for orders and genera.

The general plan and arrangement of the genera and orders in the the work is that of the Genera Plantarum, the Gymnosperms, however, being placed last. The orders are consecutively numbered, and the genera arranged in each systematically and numbered, beginning in each order with 1. In addition, the genera are provided with another set of numbers, beginning with the first in Ranunculaceæ and running on consecutively to the last in Cycadaceæ. This gives to each genus a ready reference number, and is one of the important features of the work.

Before describing the labels to be used in the National Herbarium it is necessary to state that hanging over the front of each shelf is a stiff flap (12 by 5 inches) of cloth-covered binders-board on which are marked the name of the order and the genus or genera to which the plants on that shelf belong.

1 Index Generum Phanerogamarum. . . . . Conscripsit Th. Durand. Bruxelles, sumptibus auctoris. 1888. (8°, pp. xxi, 722. £1.)

Order labels are printed in heavy-faced capitals followed by the number of the order. This is pasted on the center of the flap. If the order is entirely exotic, the label is printed in red ink. The same color is used for foreign genera, as described below. This device saves a large amount of time when one is looking over the shelves for American plants.

The genus labels are of two kinds, one for the shelf-flaps the other for the genus covers themselves, both printed in heavy-faced type.

The shelf flap genus labels consist of the name of the genus preceded by its consecutive number in Durand, and followed by its number in the order to which it belongs, thus:

4742. Asclepias. 63.

These labels are pasted one below another in their numerical order, beginning at the upper left corner of the flap. As the name and number of the order are already on the flap, it is considered unnecessary and undesirable that they be printed with the name of each genus. The authority for the genus is also considered entirely unnecessary. If the genus is wholly exotic, or is large, and one or more shelves contain only exotic species, their labels are printed in red.

The genus-cover labels, which are pasted on the lower left corner of the genus cover, contain the name of the genus, with the number of its order below, and its consecutive number still lower, thus:—

Asclepias
Order. 116
4742.

This form of label enables one to know precisely to what place to return a bundle of specimens which has been taken from the shelves. The number of the order is inserted as being often desirable. If any genus-cover contains entirely foreign species its label is printed in red.

In this system but few complexities occur. Perhaps the least rare are those cases in which a genus in Durand is treated by American authorities as two or more genera. When this occurs the American generic names are adopted, using in parenthesis, the numbers of the genus to which Durand refers the American genera.

The use of Durand's Index seemed at first to be objectionable for the reason that the Genera Plantarum, which must of necessity be the more used of the two works, had a different numbering. This difficulty has been removed by simply renumbering our copy with ink.

This is to be done also with our copies of Gray's Synoptical Flora.—FREDERICK V. COVILLE, *Assistant Botanist, U. S. Department of Agriculture*

Penicillium and corrosive sublimate.—Penicillium has a way of upsetting all "facts" with regard to the habitat of fungi. Dr. J. N. Hurty, of Indianapolis, has sent to the writer a flour paste which he prepares and which contains a considerable amount of mercuric chloride, completely

covered by a rank growth of Penicillium glaucum. When asked for the percentage of corrosive sublimate, Dr. Hurty could not give it quantitatively, but furnished the following statement: "Our paste pot holds one pint, and to one-half this quantity one or two fluid drachms of a saturated solution of the poison was added. One drachm of saturated solution added to one-half pint would be about 1 part in 900. The paste always had a strong metallic, corrosive taste, and showed quantitatively that mercuric chloride was present in pronounced amount."

Dr. Farlow was kind enough to examine and confirm the specific nature of the fungus.—JOHN M. COULTER, *Crawfordsville, Ind.*

EDITORIAL.

WE FEAR that the recent proposition to give names to all the minor variations and forms of plants, cultivated or wild, will precipitate us into such a miry slough of nomenclature that we shall never escape. The proposition has a good end in view, and we are in hearty sympathy with the purpose of recording the variations to which plants are subject. The manner in which this is to be carried out, however, is of the utmost importance. If every one who comes across a plant whose leaves do not quite accord with the description of the species is to rush into print in the nearest journal with a description of "*forma lanceolata*" or "*subforma terrestris*," we shall erelong have to cry, "Hold! enough!" The process for the recording of variations must be the same as for revising the species of a genus. If some particular species is suspected of being variable, a large number of specimens, with full data of collection, must be obtained and carefully studied. Only prolonged study and abundant material will enable any respectable opinion to be formed.

In our judgment the time is hardly ripe here for this study. There remains yet too much land to be possessed. In England and western Europe protracted study of the flora has fairly exhausted the species, and some are ready to turn to varieties and forms. Here a vast amount of work is to be done in collecting and *properly* describing species.

PROPERLY DESCRIBING species has been too little heeded by those who have dealt with North American plants, particularly the cryptogams. Mischievous species-making is a greater evil even than the violation of the law of priority, for the intent of the author who uses a too-modern name can usually be ascertained; but he who imperfectly describes a species often puzzles generations.

In three ways the soul of the righteous conservative systematist is vexed. First, by too brief descriptions. One can hardly pick up a number of *Grevillea* without being struck by the absurdly condensed diagno-

ses there given. When Cooke and Massee describe a Glœosporium on cultivated Pelargoniums in three lines, who can believe that it is *adequately* characterized? When that species is found on wild Pelargoniums, as it well may be, does anyone think that it will be *easily* identified? Will it not rather necessitate a painful expenditure of time, and perhaps even then (should the type specimens be lost) have to be relegated to the limbo of "species non satis notæ"? The case has many parallels.

Again, he suffers from the description of imperfect material. Mitten sees *two stems* of a Hypnum in Douglas's collection and describes it as a new species! with the remark that it may be an already described species! Austin receives a sterile Hypnum from Colorado, and describes it as a new species, comparing it with four others in widely separated sections of the genus! Kindberg finds a moss in Macoun's collections, and though he is unable to determine to which of two very unlike genera it belongs, describes it as a new species! Examples might be multiplied.

Again, he is exasperated by description by comparison. For example, Kindberg recently describes a Bryum, of which he had neither inflorescence nor fruit, in five or six lines, and by comparing it with a well-known species, to which he imagines it allied. Now no finite intelligence can determine the affinity of a Bryum by leaves alone; and when over half of the points of comparison are within the known range of variation of the older species, we must conclude that the description is of little use except to legalize a name. Such names are only incumbrances, not helps. His alleged description is too brief, purely comparative, and based on entirely insufficient material. It is a type of all that is bad in its line. Let us hope that the species makers will cease

Giving diagnoses instead of descriptions;

Comparing a new species with an old, except as a supplement to a full description; and

Naming material which is only fit to be shelved till it is completed by further discovery.

CURRENT LITERATURE.

The New Manual.[1]

For some years previous to his death, Professor Gray had in contemplation a revision of his popular text-books, the Lessons, Manual and Field, Forest and Garden Botany, all of which were out of date, and, the

[1] Manual of the botany of the Northern United States, including the district east of the Mississippi and north of North Carolina and Tennessee. By Asa Gray, late Fisher Professor of natural history in Harvard University. Sixth edition, revised and extended westward to the 100th meridian, by Sereno Watson, curator of the Gray Herbarium, Harvard University, and John M. Coulter, Professor of Botany in Wabash College; assisted by specialists in certain groups. Ivison, Blakeman & Co., New York and Chicago. 1890. Octavo, pp. 760, with 25 plates illustrating the sedges, grasses, ferns, etc.

latter especially, unsatisfactory to him. He lived to carry out the revision of only the first of these, the plates of which were cast just before his departure for Europe in the spring of 1886. Realizing the futility of undertaking the greater task of re-writing the Manual, he had planned to confide this work to his associate in the Harvard Herbarium, and the senior editor of the GAZETTE, hoping to exercise a general supervision himself. Unfortunately he was not spared for this, but it is evident that the work was left in good hands, and the editors of the new edition are deserving of praise for the faithfulness with which they have striven to make the book what Dr. Gray wou'd have made it himself.

As a book it is every bit as good as the last edition, which is saying a good deal for a volume containing so many abbreviations and technical expressions and symbols, over which printers are apt to stumble. As a manual for convenient use, it is considerably better, since its range has been extended to the eastern limits of the Rocky Mountain flora, and its scope has been enlarged so as to once more include the Liverworts, these changes involving the addition of five excellent plates of detail figures similar to the twenty of the last edition, which are reproduced. With the Manual for the northern and eastern region, Coulter's Flora for the Rocky Mountain section, Chapman for the south, and Lesquereux and James for the mosses of the entire country, students are pretty well equipped for the study of our flora above the Thallophytes, so far as all but the Pacific coast and Texan regions are concerned. Notwithstanding the many additions that have been made in the last ten years, the Botany of California still renders good service for the first of these, and the Botany of the Boundary Survey and the reports on the collections of other expeditions of the same character, make it possible, if not easy, to name plants from the latter.

Had the new edition of the Manual appeared after a greater lapse of time since Professor Gray's death, it would undoubtedly have shown a greater number of unfamiliar names than is now the case; but it is gratifying to find that in an edition planned by him a conscientious effort has been made to conform as far as possible to his views regarding the limitation and nomenclature of species, so that the changes that now appear would have been made for the most part had he been permitted to revise the book himself, as is evinced by the many changes in the Gamopetalæ of its region made by the author in his study of these plants for the Synoptical Flora.

The editors will doubtless be criticised for this feature of their work, since there is now an unmistakable disposition to fix the earliest-used specific name as that of the species, under whatever genus this may first have been placed, a tendency which in some quarters reaches for both generic and specific names back of the Linnæan introduction of binomials, regardless of the number of changes that are involved, or of the number of species that it attaches to the growing list of the reformer; and the

adoption of this system would have considerably increased the number of changed names in the new Manual. Although the tendency referred to repudiates in several important respects the code adopted by the Congress of 1867, which was framed by botanists quite as wise in their day and generation as any who now pass judgment on their views, it can not be denied that a rigid application of the principle of priority can scarcely lead to any other result; and it may be that with the concurrence of the next generation the temporary unstability of the nomenclature will finally give the real stability that all botanists desire. At any rate, there is yet room for an honest difference of opinion on some points involved, and although this may make it the duty of monographers to indicate as a synonym the name that a given plant would bear under the system that they reject, this could hardly have been expected in a work like the Manual, which does not pretend to go into synonymy, and the editors of the new edition would have been more justly criticised had they followed the method that did not meet with the approval of the author of the book, than they can be for doing what they had his testimony that he would have done had the work been performed by his own hand. In this connection, however, attention ought to be called to the unadopted changes in generic names in the Nymphæaceæ that have recently been discussed in the Bulletin of the Torrey Club, and to the unaccepted substitution of Hicoria for the familiar Carya. However it may be with these genera, it is to be regretted that Spergularia of the old edition appears in this edition as Buda and not Tissa. The priority of the latter, to be sure, is only that of a few pages of a book, both being used in the same work by one author; but the birthright of Tissa is not invalidated by this fact, and its use in a recent monograph of the genus by Dr. Britton, prior to the appearance of the Manual, is an additional reason for its use there as a means of avoiding an increase in the number of synonyms.

The usefulness of the book, for beginners, is considerably increased by the incorporation of a glossary, not found in the last edition, and by the provision of a synopsis of the orders in addition to the well arranged artificial keys; and the index now includes the species of large genera, and several confusing popular names—changes that greatly facilitate reference.

Those who use the book during the coming season, especially near the limits of its range, are likely to discover little shortcomings in the distribution of species: and to such it should be a pleasure to communicate to the editors specimens showing any considerable omission.

Probably those who study local floras, where it is frequently easy to distinguish varieties without transition forms, will take exception to the Manual blending of some nominal species or varieties with accepted species. For instance, Poa cristata is almost too distinct from annua to pass for a mere form of that species, and Festuca Shortii is equally distinct from F. nutans in its typical form; and it is probable that more cases of

the same sort occur. Except for a few such, however, the botanist who knows the plants of an extended region will approve of all such unions as appear in a necessarily hasty review of the book.

In some few instances, though the editors have evidently done their work anew for this edition, and have not contented themselves with compiling from earlier editions or other sources, defective descriptions or the omission of really crucial characters are noticeable. Thus, the imbricate petals of Anonaceæ are still called valvate; Potentilla rivalis, var. pentandra is redescribed as having five stamens, whereas the number is usually six or eight, five being very exceptional in the specimens of the Engelmann herbarium and in many that have been examined in the field by Mr. Hitchcock; the petaloid filaments of Thalictrum clavatum are called club shaped, etc. Very useful distinctions between Oxalis corniculata and its variety stricta are afforded by the rhizomes and dichotomous inflorescence of the latter, from which O. recurva, which resembles it in some respects, differs in the trimorphic heterogony of its flowers. It might also have been well to note that the blue flowered flaxes, introduced in the East, belong to two well-marked forms, one of them, which has been separated under the name of L. humile, having widely-dehiscent capsules with ciliate septa, the other, with nearly closed capsules the septa of which are not ciliate. The reviewer must also plead guilty to having omitted the very important characters derivable in Epilobium from the innovations, which consist of sessile buds in no. 1, of dense rosettes at base of the stem in nos. 4 and 5, of running leafy shoots in nos. 7 and 8, of scaly rhizomes in no. 9, and of filiform bulbiferous shoots in nos. 2, 3 and 10. But whatever little defects may be noticed in one way or another, both amateurs and working botanists, who are concerned with the flora of the northern states anywhere east of the Rocky Mountains, will be grateful for so good a book, and feel disposed to congratulate the editors on the very satisfactory way in which they have brought it out.—WILLIAM TRELEASE.

OPEN LETTERS.

Deep-water Nostoc.

In the sentence "When Dr. Wolle's 'Fresh Water Algæ' appeared, this Nostoc was not mentioned," in my note in the GAZETTE, November, 1889, p. 291, I referred to the deep-water Nostoc of Lake Michigan. If I had said "Our deep-water Nostoc was not mentioned," I should have expressed my thought more perfectly. C. B. ATWELL.

Evanston, Ill.

Some more queer botany.

In a letter in this department last year a writer called attention to "some queer botany" which he found in a "doctor-book." If only it could be confined to this class of publications less harm would result than now

when so much that is queer finds its way into the text-books. One of the editors gave, in the January number, page 23, a notice of the revision of Wood's Lessons in Botany, and it is perfectly evident that that editor had not given more than a cursory glance at the book before writing the notice. If he had he could not have failed to notice some things that I think will make "mighty interestin' readin'" for the subscribers to the GAZETTE. The fact that such statements stand in a book that is to be the introduction of many young students to the science of botany will, however, rather sadden teachers to whom may fall the task of eradicating the false notions. If you can find space, Messrs. Editors, pray reprint a few of the more striking blunders that have been put into such a handsome dress in this new text book.

§ 129. "The stigma is the *glandular orifice of the ovary*,[1] communicating with it either directly or through the tubiform style."

§ 194. "Air, or rather its oxygen, is required for the *conversion of starch into sugar—a process always depending upon oxidation.* The oxygen absorbed *unites with a portion of the carbon o the starch*, producing heat,, evolving carbon dioxide, and *thus converting the remainder into grape sugar* soluble and nutritive."—Queer chemistry, too.

§ 196. "The cause of the downward tendency of the root is a theme of much discussion. Some have referred it to the principle of gravitation; others to its supposed aversion to light. But it is a *simple* and *satisfactory* explanation [*sic*] that its growth or cell development takes place most readily on the moist side of its growing points, and consequently in a downward direction [and then the writer naively adds a qualification which upsets the 'simple and satisfactory explanation' completely] so long as the soil in contact with its lower surface is more moist than that above."

§ 198. "The *leading propensity* of the root is to *divide itself.*"

§ 199. " . . . the fine rootlets, or fibers, are covered by *dry* protective cells, forming a root-cap. . . . 'They (the root-hairs) *are developed and perish annually* with the leaves. . ."

§ 416. "The bark. . Next to the bast is the green cellular layer, *called phellogen.*"

§ 427. "Respiration. . . So with plants; they *suck or draw in* air through openings in the epidermis already described (stomata), and when it is discharged it is found to be changed in character, having been robbed of its oxygen *OR its carbon dioxide.* The oxygen of the air while among the tissues *unites with substances found there*, and *new material for plant growth is thus formed*; in the *night* carbon dioxide is breathed out."

§ 432. "How the elaborated sap passes back and even downward through cells and vessels that are at the same time employed in conveying the crude watery fluids up from the root is not understood. We are not acquainted with any physicial or chemical force which causes the crude sap to creep through the cells and ducts of the trunks and branches of the great trees, hundreds of feet in height; nor is the transfusion of the prepared fluids and cell materials to every part of the plant's structure where food is required less difficult to explain. In fact observation and experiment have thus far failed to account for these mysterious movements."

§ 456. "Variety *or* race *is a sub-species.*"

§ 497. "Species *or* races."

Can anything "queerer" than some of that be found in "doctor-books"? I trow not. R.

[1] Italics mine.

NOTES AND NEWS.

PROF. T. C. PORTER describes and figures a new Californian Aste (*A. Torreyi*) in *Bulletin of Torr. Bot. Club* (Feb.).

A MEMORIAL FUND is being raised for the benefit of the widow and children of the late Professor McNab of Dublin.

PROFESSOR F. L. SCRIBNER has published a key to the genera of the native and cultivated grasses of Tennessee. It is an extract from the Station Bulletin.

PROFESSOR J. T. ROTHROCK and Professor W. T. Wilson, of the University of Pennsylvania, have become associate editors of *Forest Leaves*, the organ of the Pennsylvania Forestry Association.—*Garden and Forest.*

MR. H. J. WEBBER (*Am. Nat.* Feb.) suggests the use of peridial cell characters in the genus Æcidium, as they are frequently used in Rœstelia. To emphasize his point he calls attention to the differences in certain species.

MOLISCH finds that the tissue under the epidermis in the fruit of Capsicum, which appears to be collenchyma, and has been designated as such, gives all the reactions of cork cells, the walls being completely suberised. He has found the same tissue in Solanum melongena var. coccinea.[1]

CONWENTZ has found tyloses in the tracheides of the root wood of the tree producing the gum which, fossilized, is called amber. Bits of the wood, found imbedded in the amber, indicate that the tree was a species of Picea. Tyloses also occur by the enlargement of the epithelium of the gum passages.

MR. GEORGE MASSEE has published a monograph of the genus *Podaxis* Desv. (*Podaxon* Fr.) in *Jour. Bot.* (February and March). The genus has heretofore been included among the Gastromycetes; but some very young material from South Africa has revealed the unexpected fact that the spores are developed in asci. Of course this removes the genus to the Ascomycetes.

DR. G. N. BEST, in *The Microscope* (Jan.), has given an initial paper on a microscopic study of the seed-wings of *Abietineæ* for diagnostic characters. He is satisfied that they can be so used in many cases, and so be added to the cumulative evidence of other characters. Such characters as "cells markedly curved," "cells straight," "outlines regular," "outlines irregular," are used, and their meaning distinctly pointed out in a plate. The Abietineæ form a group in which good diagnostic characters can not be too much multiplied.

PROFESSOR W. E. STONE, of Purdue University, has been investigating the occurrence of cane sugar in the sweet potato. His results are published in *Agricultural Science* (February), and are summarized as follows: The saccharine substance of the sweet potato exists chiefly, if not entirely, in the form of sucrose; the use of the polariscope in the quantitative determination of the same seems possible, such determinations showing 1½ to 2 per cent. of sucrose in the fresh potatoes; the temperature of cooking (baking) inverts the sucrose, and converts more or less of the starch into a soluble form.

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[1] Berichte der deutsch. bot. Gesells. vii. 364.

DR. J. M. JANSE gives a voluminous account of the protoplasmic movements in Caulerpa prolifera in a recent number of Pringsheim's *Jahrbücher für wissenschaftliche Botanik* (xxi. 163-284, pl. vi-viii). After studying them in all the organs, and their displacement upon wounding, he concludes that their purpose is to distribute the nutritive materials through the plant.

THE NON-CRYSTALIZED coloring matters of lichens have been carefully studied by Dr. E. Bachmann.[1] He finds sixteen which can be readily distinguished by microchemical means, five greens, one blue, four reds and six browns, in the 120 species examined. In one case the coloring matter occurred in drops in the cell contents; in two cases as excretions on the outer surface of the cell membrane; in all the other instances it was found in the cell membrane itself. In the thallus it is almost always in the cortical region. In the apothecium it may be in any part, but is rare in the hypothecium. The walls of the asci are not colored, but the paraphyses. In the cell walls the middle lamella usually contains the most of the color.

THE LAST PART (Part III) of vol. xvii of the Transactions and Proceedings of the Botanical Society of Edinburgh contains the following papers of general interest: Observations on the wood of certain resin-producing trees, *A. Galletly*; Observations on annual increase in girth of trees *David Christison*; A summary of the botanical features of the country traversed by the Afghan Delimitation Commission during 1884-85, *J. E. T. Aitchison*; The flora of the coasts of Lapland and of the Yugor Straits, *Philip Sewell*; Galls of Norway, *J. W. H. Trail*; Enumeration of fungi collected in Hardanger in 1887, *J. W. H. Trail*; Fertilization of Aspidistra elatior by slugs, *John Wilson*; Manna from a Persian species of Astragalus, *A. Galletly*.

BUSCH GIVES the gist of his paper in the opening paragraph, which we preserve entire and translate as follows: My observations on different green vegetative parts of plants in constant darkness have led very quickly to the conclusion that the destruction of the chlorophyll is not a primary effect of the darkness, but that the chlorophyll itself may persist unaltered for a long time in darkness, provided that the cell remains alive; on the contrary that the destruction of chlorophyll in darkness is only a secondary phenomenon which appears in connection with the dying of the cell on account of the lack of light, as a symptom of the emptying which here precedes death, analogous with the destruction of chlorophyll upon the autumnal emptying of the leaves.

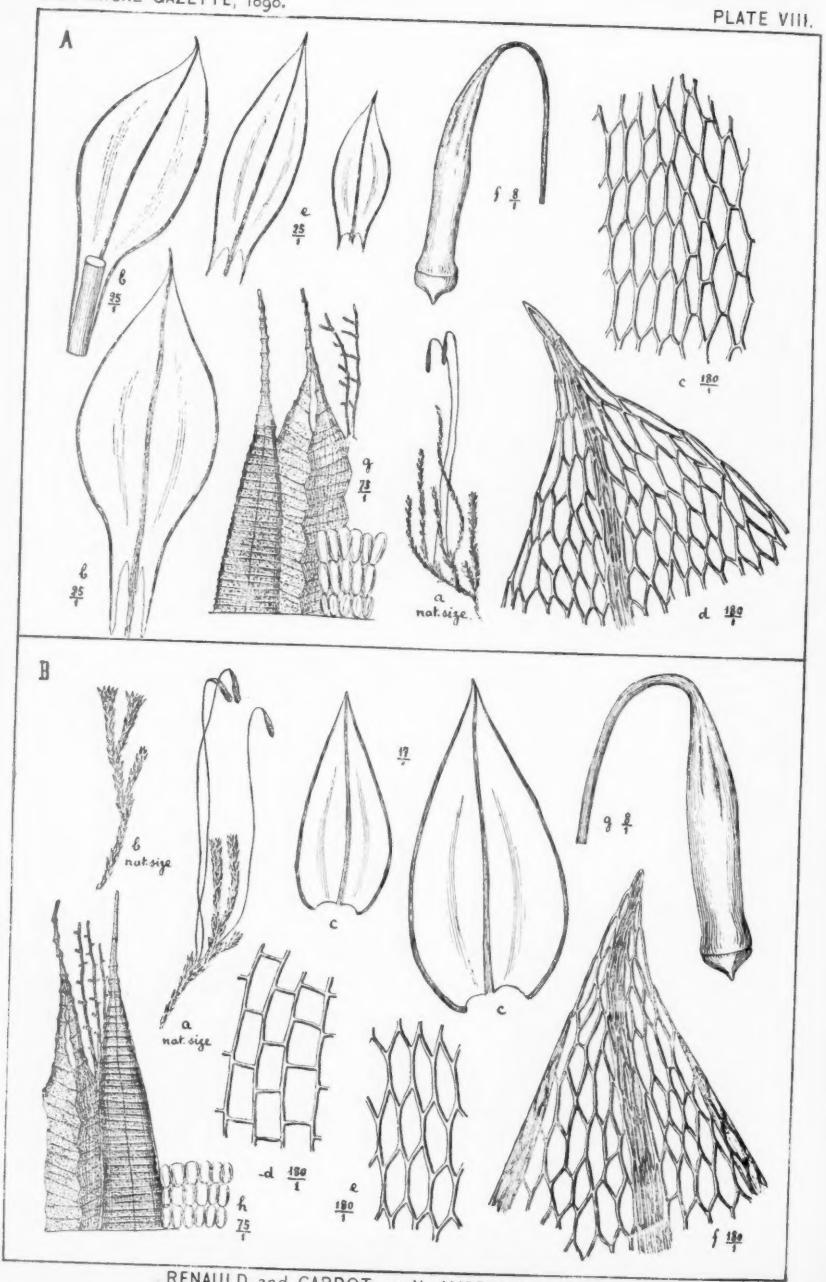
THE FIRST annual report of the director of the Missouri Botanic Garden has been issued. It contains a statement of the changes that are being made in the Garden, or that are in immediate prospect. In order that the development of the plans may be properly noted, a map of the grounds on a large scale is being prepared. The remainder of the report contains a statement of the policy of the trustees (as already published in this journal), the announcement of the establishment of the garden scholarships, and an exposition of the relations of the Shaw School of Botany to the Garden. The director requests from authors copies of their publications for the library, from collectors specimens for the herbarium, and promises all feasible assistance in work calculated to promote botanical knowledge.

[1] Pringsh. Jahrb. f. wiss. Bot. xxi. 1-61, pl. 1.

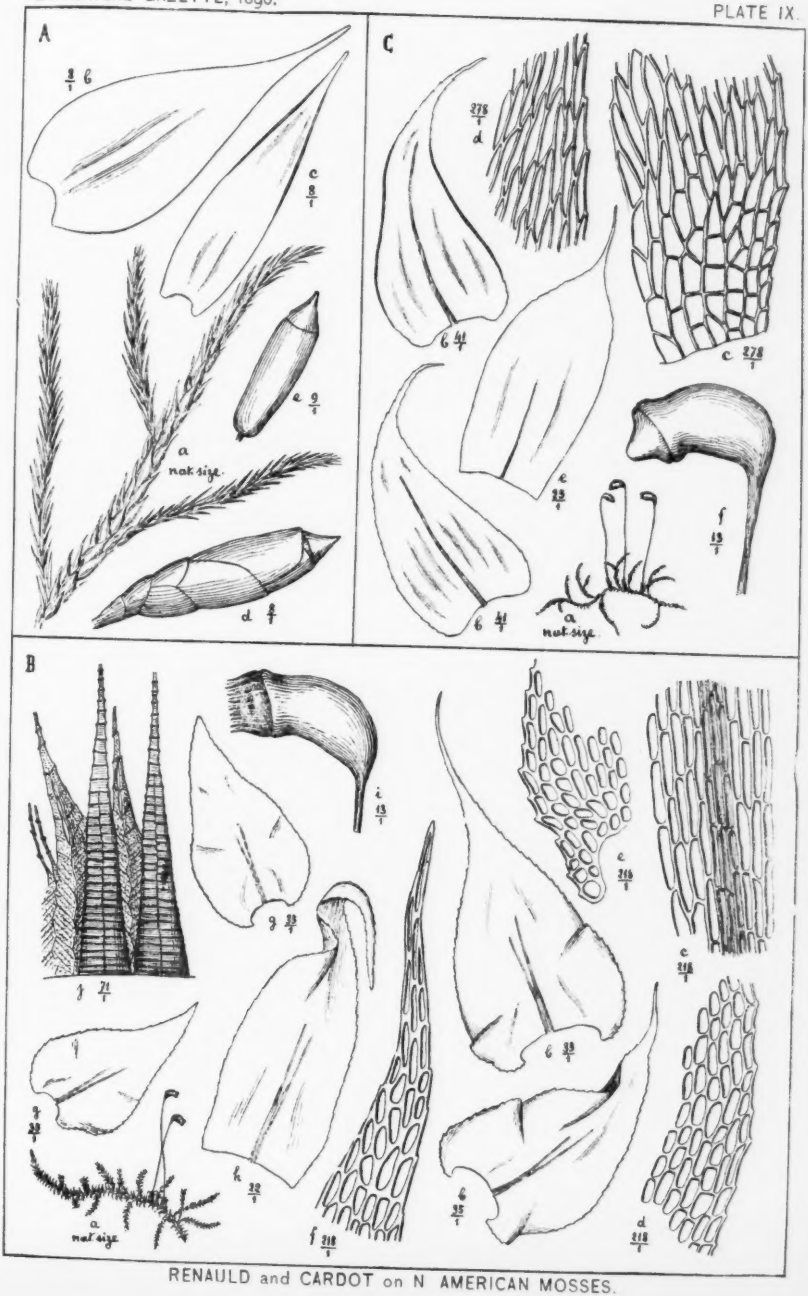
PETER HENDERSON, widely known as a seedsman, florist and gardener, and the author of two or three widely-read books, died at his home in Jersey City, January 17. He had been in excellent health up to a short time before, when he was taken with the "grip." This attack did not at first appear to be serious, and he was shortly able to be out. But a chill followed, causing an attack of pneumonia which proved quickly fatal. Mr. Henderson was born in Pathhead, a small village near Edinburgh, Scotland, in 1823. He left school at the age of fifteen, with a fair English education, and became apprenticed to a gardener. He became greatly interested in botany, and before he was eighteen years old had twice competed successfully for the medals given by the Botanical Society of Edinburgh for the best herbarium of native and exotic plants. When his four years' apprenticeship was completed he came to New York. In 1847 he began business as a market gardener in Jersey City, and for twenty years or more that was his principal business. But his taste for ornamental gardening grew and he became a florist, and later still a seedsman. The seed business proved most important of all. At the time of his death he was accounted one of the most successful and widely-known seedsmen in the country. The first of his books, entitled "Gardening for Profit," was brought out when he was in the market-gardening business; but it has been revised and later editions published, and proved a most successful work. Over 100,000 copies have been sold. Later he published "Gardening for Pleasure," which also sold well, and still later, his "Handbook of Plants." The last-mentioned book was revised during the last year, and is still in the hands of the binder.—*N. Y. Times* (*emend.*).

STRASBURGER'S present statement of the growth of the cell-wall as set forth in his last paper on the subject[1] is as follows: The cell membrane arising upon the division of a cell is formed by the direct alteration of the cell plate, which is of cytoplasmic nature. The same is true of new membrane or new layers formed without division. Membranes or layers arising thus either do or do not grow according as substances from the cell do or do not penetrate them. The most common intrusive substance is the living cell plasma (hyaloplasm) which is altered in the membrane into its own substance. In certain cases the growth of the membrane through direct penetration of substance like the existing membrane is not excluded, but it is not proved. The intrusion of living hyaloplasm takes place especially in those membranes which are becoming cutinised or suberised. It is less certain that it occurs in lignification, but not improbable. The common stratification of membranes is due to apposition, *i. e.*, to the continued successive formation of layers from the peripheral cytoplasm. The surface growth in some cases is due to the stretching or rupture of the older lamellæ and the progressive deposition of new ones. In other cases it is in all probability due to penetration of material into the membrane. That the intrusive substance is hyaloplasm is not certainly proved; that it is dissolved cellulose is not excluded. It would seem from the above that the two long-opposed theories of the growth of the cell wall were in a fair way to be reconciled. Strasburger admits the possibility of intussusception (in the older sense) in some cases, and points out a modified intussusception for other cases of surface growth. Still other cases of surface growth and the ordinary growth in thickness are by apposition.

[1] Histologische Beiträge II.—Ueber das Wachsthum vegetabilischer Zellhäute.



RENAULD and CARDOT on N. AMERICAN MOSSES.



RENAULD and CARDOT on N. AMERICAN MOSSES.

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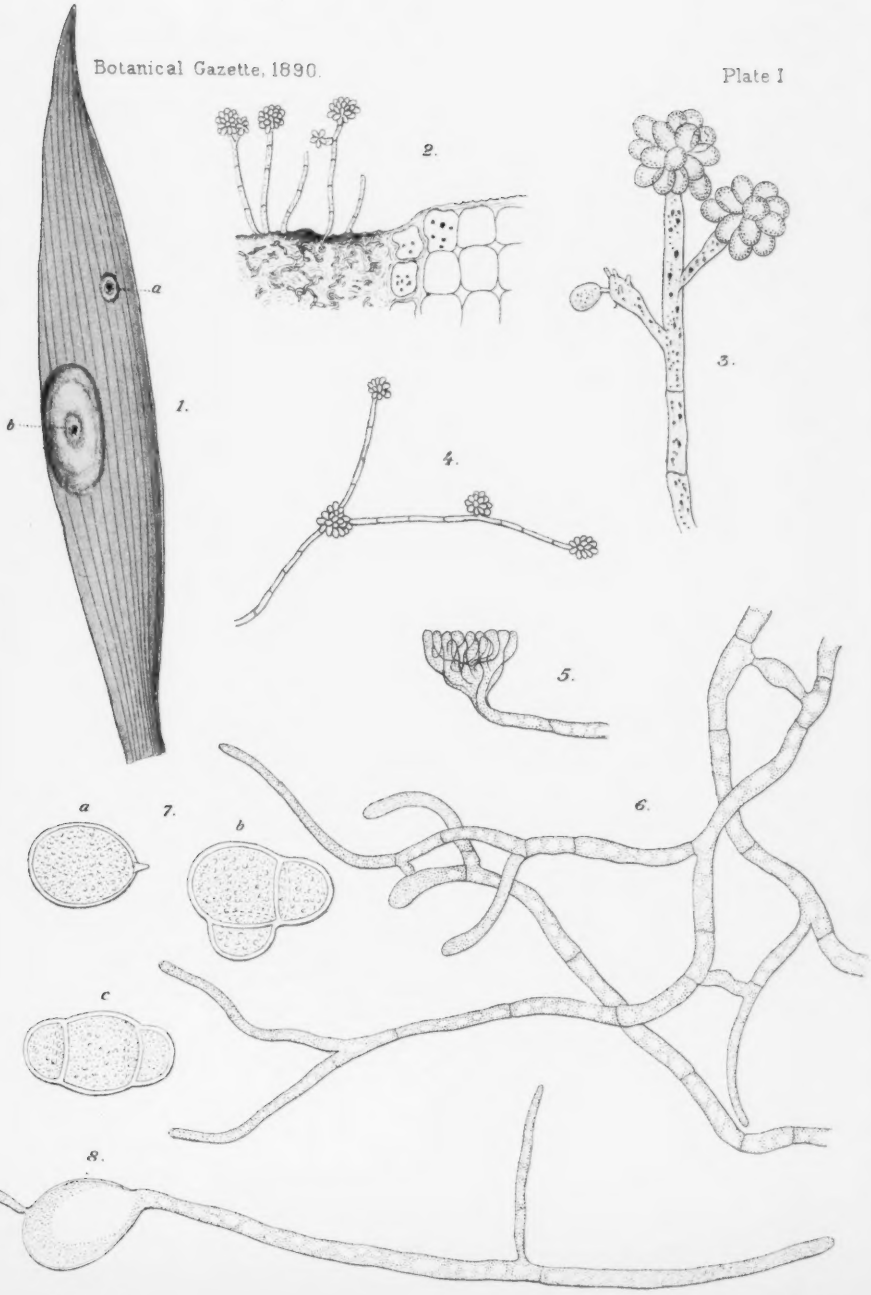

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KEAN ON A BERMUDA LILY DISEASE.

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DONNELLSMITHIA GUATEMALENSIS, n. sp.

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